

variant readings, and many corrections of the text due to this editor.

(3) Hume's dialogues on natural religion run on much the usual lines. The characters are three in number, Demea the representative of believing scepticism, Philo of unbelieving scepticism, and Cleanthes of conciliatory rationalism. But there is this peculiarity in Hume's treatment, that, while there is no doubt that his own standpoint is that of Philo, he has chosen to make Cleanthes the hero, and concludes his work with the opinion that Philo's principles are more probable than Demea's, but that those of Cleanthes approach still nearer to the truth. The essays on suicide and on the immortality of the soul have been preserved only by accident, as their author attempted to suppress them. The German translation and introduction are from the pen of the well known professor in Berlin, and, like everything published in this philosophical series, are excellent.

(4) This volume contains about fifteen of Kant's smaller metaphysical and logical works, some of them translated from Latin, some of them written before the birth of the "critical" philosophy, not all of them interesting or important. They range over a variety of themes, from the dreams of a spiritist (viz. Swedenborg) to the well known prize-essay on the progress of metaphysics since the time of Leibniz and Wolf. This editor's introductions to the various essays and treatises are extremely helpful and interesting.

(5) The encyclopædia, the only complete and authentic statement of Hegel's system—best known to English readers by the late Prof. Wallace's translations of its first and third parts—is here published in an excellent form. In the introduction the editor discusses (a) the fundamental ideas of the Hegelian philosophy; (b) philosophy as science; (c) the encyclopædia, and Hegel's relation to earlier systems.

OUR BOOK SHELF.

The Oxford Geographies. Vol. ii. The Junior Geography. By A. J. Herbertson. Pp. 288. (Oxford: Clarendon Press, 1905.) Price 2s.

WHEN a school-book treats of the geography of the whole world in less than 300 pages of large, clear print, interspersed with abundant diagrams, its claim to compete with the ordinary class-book must be based on the substitution of quality for quantity, wise selection and arrangement for all-including comprehensiveness. The book before us may fairly make such a claim. There is nothing of the gazetteer about it: its method is that of connected description; in place of statistical tables we have an abundance of distribution-maps, and continents and countries are divided according to physical features more than by political boundaries. Thus in the case of England the counties are entirely ignored, and the pupil is spared the necessity of learning as many "facts" about Oxfordshire as about Lancashire. So, too, in the case of Europe, there is a special section on Alpine lands, which renders possible a connected account of the railway routes across the Alps, and should prevent the common misconception of the Alps as coextensive with the political area of Switzerland.

Nearly one-third of the book is occupied with the British Isles, and about as much with Europe, the

remainder being about equally divided between Asia, Africa *plus* Australia, and America. It would be easier to form a judgment on the opening part if the "Preliminary Geography," which is intended to precede it, had been published. As it stands, this opening part, consisting of a large number of distribution-maps (orographical, climatic, industrial, &c.) of the British Isles, with a discussion of their meaning and relations, is full of suggestiveness to the enthusiastic teacher, and in his hands is capable of expansion into a course of practical geography.

In such a book the critic can, of course, find plenty of missing "facts," though we have found remarkably few of first-rate importance. Several which we failed to find in the text turned up in the maps, which is just as well in view of the importance which the author attaches to the study of maps. ("Look at the map and notice . . ." is a constantly recurring phrase.) Chicago, it is true, appears to be only casually mentioned on p. 262, without any allusion to its unique geographical position with reference to the Mississippi basin and the great lakes; and along with the trans-Alpine routes to which we have already referred we should have expected to find some account of the longitudinal route of the Orient express. While the numerous diagram-maps form one of the best features of the book, their execution is unequal, the lettering on some being indistinct and the shading sometimes amateurish. In the map of the chief North American railways the names of the lines might be given as far as possible, and the route of the projected Grand Trunk Pacific continued to Port Simpson instead of ending at Winnipeg; while in Fig. 22 it seems unnecessary to distinguish part of the Scotch coal-fields merely because the coal is of Lower Carboniferous age. A. M. D.

Organic Evolution. By C. W. Saleeby, M.D. Pp. 124. (London and Edinburgh: T. C. and E. C. Jack, n.d.) Price 1s. net.

DR. SALEEBY has written a little book on a great subject, and there is much to admire in his achievement. Without technicalities and with vivacious clearness he discusses the history of the idea of organic evolution, the so-called evidences which show the validity of the evolution-formula, the conditions of evolution (heredity and variation) and the factors in the process (natural and sexual selection), the evolution of plants, the history of the horse, the past and future evolution of man. And we can get all this for a shilling! The author writes in an unconventional chatty way, and is nothing if not up to date. He seems, however, to have written in hot haste, for he makes many slips. Perhaps it does not matter much that he speaks of Alfred Russel Wallace as being in 1858 "a young surgeon," but it is hard on the whale to have it said of him that his five "fingers, hand and all, are buried deep in blubber, and serve him no purpose whatever." Surely Dr. Saleeby's teacher, Sir William Turner, to whom he gracefully refers, will be rather shocked at this libel on the whale's flipper. Perhaps it does not matter much that a certain Matthew Hay (Patrick Matthew?) is credited with having conceived the idea of natural selection in the early years of the nineteenth century, but we are somewhat baffled by being twice told that while the hen has three and a half fingers, the embryo chick has a *five-fingered hand*. If we dissect the embryo we shall see this, we are told. We do not like Dr. Saleeby's version of the lineage of extinct forms "which continuously connect the horse of to-day with a five-toed ancestor," but we object still more to the statement that "the adult or fully-developed barnacle is far inferior to the larva, for it

is little more than a fixed fleshy stalk, upon which grows the body and its shell"—"a palpable case of what we call degeneration." If all degeneration were on the lines of the barnacle's life-history, it would be difficult to distinguish it from progress. We wish there had not been these and other blemishes in this sprightly and interesting little book, for it is sure to be popular.

J. A. T.

Le Chauffage des Habitations par Calorifères. By M. Raymond Périssé. Pp. 173. (Paris: Gauthier-Villars et Fils, n.d.) Price 2½ francs.

THIS little work is of a very practical nature; and although it appeals more particularly to the engineer and architect it may be read with advantage by the general reader, for it sets out, in a manner which is clear and easily intelligible to all, the advantages which accrue from the systems of heating dwellings by the various warming apparatus which are installed, not in the living rooms, but on the ground floor or in the basement. The advantages in the use of steam, hot-water, or hot-air apparatus, instead of fireplaces or stoves, are certainly real ones; for the house is more uniformly and better heated, at a less expense, trouble, and risk, and the apartments are not encumbered with the large stoves so generally seen on the Continent.

The advantages and disadvantages of the different systems are explained, and various applications of these systems are illustrated. The reader is also told how each may be best applied and regulated to meet the variable requirements as to heat, the different circumstances of the dwelling, the conditions of occupancy, and the like.

Auslese aus meiner Unterrichts- und Vorlesungs-praxis. By Dr. Hermann Schubert. Erster Band. Pp. 240. (Leipzig: G. J. Göschen, 1905.) Price 4 marks.

TEN chapters dealing with a variety of subjects—logarithms, cyclotomy, the theory of physical dimensions, systems of circles and spheres being the most important. The principal novelty is the treatment of logarithms (pp. 1-68), fair approximations being obtained by combining inequalities such as

$$-\log m + 2 \log (m+1) - \log (m+2) > 0.$$

The method is quite elementary and very ingenious, but it has no practical value, and strikes one as being artificial. The chapter on dimensions (reprinted from the *Naturw. Wochenschr.*, 1895) is interesting, but not convincing; its essential feature is

$$[\text{mass}] = [\text{length}]^3 [\text{time}]^{-2}.$$

Pangéométrie; ou Précis de Géométrie fondée sur une Théorie générale et rigoureuse des Parallèles. By N. J. Lobatschewsky. Réimpression facsimilé conforme à l'édition originale. Pp. 279-340, and list of errata. (Paris: A. Hermann, 1905.) Price 5 francs.

LOBATSCHEWSKY shares with the Bolyais the credit of founding the theory of non-Euclidean geometry, in which Euclid's axiom of parallels is not assumed to be true. His "Pangéométrie" was communicated to the mathematical faculty of the University of Kazan in 1855 on the occasion of his jubilee; this fact might well have been indicated in the present reprint. It is the author's last and most complete exposition of his theory, and mathematicians will be glad to have it in this accessible form, though, like other similar reprints, it is rather trying to the eyesight.

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LETTERS TO THE EDITOR.

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The Bates-Müller Hypothesis of Mimicry: a Question of Historical Accuracy.

A PAPER dealing with the above subject, by the late Dr. A. S. Packard, has just been published in the *Proceedings of the American Philosophical Society* (vol. xliii., No. 178, p. 393), in which this well known entomologist endeavours to show that the markings of organisms ("pöcilogensis") are "due to the physical rather than to the biological environment." I must leave it to others to consider how far the late author has established his case as against Bates, Fritz Müller, and those who have accepted the theories of mimicry associated with these names. My object in asking you to give space to this letter is to point out a distinct error which, if allowed to pass unchallenged, is likely to be accepted as a true statement of Darwin's views in the sense conveyed by the American writer.

Happening to know the actual history of the Müllerian theory of mimicry through the courtesy of Mr. Darwin himself, I can assure those who read the paper that the passage which is quoted does not refer to that theory at all. In the letter to Fritz Müller referred to (August 28, 1870) Mr. Darwin says:—"I should not be at all surprised if your suggestion about sexual selection were to prove true; but it seems rather *too speculative to be introduced in my book*," &c. ("More Letters," vol. ii., p. 91). Now Dr. Packard quotes only the words which I have italicised as "Darwin's own estimate of Müller's little paper," but this is a misstatement of the facts. Darwin, it will be observed, is referring to a suggestion about sexual selection, and I am in a position to state what that suggestion was. At the date of the correspondence quoted (1870), Fritz Müller had observed the striking resemblances, or "mimicry," between butterflies belonging to "protected" groups, as, in fact, Bates had done before him. In searching for an explanation of this apparent violation of the Batesian theory, he suggested that it almost appeared as though the females of one protected species had been influenced in their choice by seeing the predominant pattern of other protected species always about them. Mr. Darwin was good enough to allow me to read Müller's letter to him, and in forwarding it to me in 1872 he added:—"You will also see in this letter a strange speculation, which I should not dare to publish, about the appreciation of certain colours being developed in those species which frequently behold other forms similarly ornamented" ("Charles Darwin," by E. B. Poulton, p. 202). This is the "suggestion about sexual selection" to which Darwin refers in his letter to Müller, and, so far as my memory serves me, I do not think this speculation was ever formally published to the scientific world.

The Müllerian theory which the late Dr. Packard considered that he had demolished was not published until 1879, the "little paper" in question having been contained in a number of *Kosmos* which Mr. Darwin forwarded to me in that year. On reading the said note I was at once convinced that Müller had found the true explanation of mimicry between protected groups, and I accordingly directed Mr. Darwin's attention to the matter and published a translation of the paper (*Proc. Ent. Soc.*, 1879, p. 20) in order to bring it under the notice of English entomologists. Writing to me in 1879 about this paper, Mr. Darwin said:—"F. Müller's view of the mutual protection was quite new to me" (Poulton, *loc. cit.*, p. 213). It is thus evident that Dr. Packard confused a tentative speculation of Müller's, which was contained only in a letter to Darwin, and probably never intended for publication, with the now well known Müllerian theory which was published formally some nine years later.

R. MELDOLA.